



## **Measuring HRTFs of Brüel & Kjær Type 4128-C, G.R.A.S. KEMAR Type 45BM, and Head Acoustics HMS II.3 Head and Torso Simulators**

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G.R.A.S. KEMAR Type 45BM, and Head Acoustics  
HMS II.3 Head and Torso Simulators

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## 5.5 Tables for free-field measurement results - right ear from figure 20 to 31

All results are shown from the sine sweep method, in 1/12th octave bands.

Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)
100	-0.03	600	2.42	3550	15.80
105	-0.03	630	2.59	3750	15.01
110	-0.04	670	2.88	4000	14.19
120	-0.05	710	2.95	4200	12.96
125	-0.05	750	3.25	4450	11.98
135	-0.06	800	3.92	4750	10.86
140	-0.06	840	4.48	5000	10.09
150	-0.06	890	4.98	5300	9.61
160	-0.04	945	5.12	5600	8.79
170	-0.03	1000	4.64	6000	7.89
180	-0.02	1050	4.21	6300	6.86
190	-0.01	1100	3.87	6700	5.35
200	0.00	1200	3.72	7100	3.73
210	0.03	1250	3.81	7500	0.75
225	0.06	1350	4.12	8000	-2.34
235	0.13	1400	4.82	8400	-2.78
250	0.24	1500	4.94	8900	0.94
265	0.37	1600	4.59	9450	5.12
280	0.50	1700	5.33	10000	4.94
300	0.63	1800	7.33	10500	5.19
315	0.78	1900	9.00	11000	8.17
335	0.95	2000	10.51	12000	9.98
355	1.14	2100	12.21	12500	9.40
375	1.32	2250	14.19	13500	9.02
400	1.50	2350	15.47	14000	8.13
420	1.68	2500	15.87	15000	8.52
445	1.85	2650	16.47	16000	1.92
475	1.99	2800	16.84	17000	-4.99
500	2.16	3000	16.33	18000	-2.37
530	2.37	3150	16.35	19000	-4.12
560	2.48	3350	15.96	20000	-4.59

Table 14: *HRTF at 0° azimuth angle, right ear - Brüel & Kjær Type 4128 HATS model nr.1*

Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)
100	0.66	600	6.60	3550	14.18
105	0.68	630	6.94	3750	13.86
110	0.70	670	7.36	4000	13.73
120	0.73	710	7.73	4200	14.16
125	0.79	750	7.67	4450	14.97
135	0.87	800	7.67	4750	15.72
140	0.97	840	8.47	5000	16.46
150	1.13	890	8.47	5300	17.10
160	1.29	945	8.04	5600	17.11
170	1.42	1000	8.08	6000	16.93
180	1.52	1050	7.63	6300	16.55
190	1.60	1100	7.61	6700	16.07
200	1.67	1200	8.27	7100	15.79
210	1.78	1250	8.51	7500	15.59
225	1.93	1350	8.84	8000	15.34
235	2.12	1400	8.90	8400	15.27
250	2.39	1500	9.20	8900	17.16
265	2.66	1600	9.54	9450	17.40
280	2.89	1700	9.62	10000	12.85
300	3.09	1800	10.34	10500	9.32
315	3.33	1900	10.87	11000	7.93
335	3.62	2000	11.49	12000	6.88
355	3.88	2100	12.28	12500	7.05
375	4.09	2250	13.66	13500	8.35
400	4.29	2350	14.84	14000	7.41
420	4.55	2500	15.91	15000	8.91
445	4.86	2650	16.64	16000	4.96
475	5.18	2800	16.76	17000	-3.64
500	5.51	3000	16.52	18000	-1.31
530	5.87	3150	16.08	19000	1.62
560	6.25	3350	15.03	20000	1.23

Table 15: *HRTF at 90° azimuth angle, right ear - Brüel & Kjær Type 4128 HATS model nr.1*

Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)
100	-0.08	600	1.65	3550	12.73
105	-0.08	630	1.84	3750	11.62
110	-0.09	670	2.04	4000	9.82
120	-0.09	710	2.46	4200	8.88
125	-0.10	750	3.08	4450	8.04
135	-0.11	800	3.63	4750	7.04
140	-0.11	840	4.46	5000	5.43
150	-0.12	890	4.92	5300	4.18
160	-0.13	945	4.94	5600	3.09
170	-0.13	1000	4.53	6000	2.04
180	-0.12	1050	4.22	6300	1.03
190	-0.12	1100	3.98	6700	-0.32
200	-0.10	1200	4.32	7100	-1.54
210	-0.07	1250	4.88	7500	-1.60
225	-0.03	1350	5.50	8000	0.15
235	0.03	1400	5.49	8400	3.54
250	0.13	1500	5.35	8900	8.47
265	0.25	1600	5.05	9450	8.01
280	0.38	1700	5.36	10000	1.02
300	0.50	1800	6.31	10500	-1.79
315	0.64	1900	7.04	11000	-2.20
335	0.78	2000	8.51	12000	-4.36
355	0.88	2100	10.32	12500	-2.32
375	0.94	2250	11.76	13500	-3.79
400	1.02	2350	12.63	14000	-3.15
420	1.13	2500	13.39	15000	0.01
445	1.23	2650	14.02	16000	-1.46
475	1.29	2800	13.77	17000	-7.93
500	1.35	3000	13.41	18000	-11.73
530	1.47	3150	13.62	19000	-20.18
560	1.56	3350	13.10	20000	-13.43

Table 16: *HRTF at 180° azimuth angle, right ear - Brüel & Kjær Type 4128 HATS model nr.1*

Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)
100	-0.74	600	1.82	3550	5.89
105	-0.72	630	2.00	3750	5.27
110	-0.71	670	2.28	4000	3.67
120	-0.71	710	2.22	4200	1.93
125	-0.70	750	1.59	4450	-0.34
135	-0.69	800	2.14	4750	-1.97
140	-0.69	840	3.37	5000	-4.56
150	-0.68	890	2.41	5300	-7.15
160	-0.67	945	2.51	5600	-10.55
170	-0.66	1000	2.71	6000	-14.88
180	-0.64	1050	1.92	6300	-17.32
190	-0.63	1100	2.12	6700	-15.67
200	-0.61	1200	2.87	7100	-13.05
210	-0.59	1250	3.00	7500	-11.81
225	-0.56	1350	3.96	8000	-11.84
235	-0.52	1400	3.91	8400	-12.24
250	-0.45	1500	4.27	8900	-11.72
265	-0.34	1600	4.83	9450	-11.11
280	-0.20	1700	5.22	10000	-11.91
300	-0.05	1800	6.00	10500	-12.02
315	0.12	1900	7.16	11000	-10.63
335	0.27	2000	8.04	12000	-9.54
355	0.39	2100	8.09	12500	-9.14
375	0.49	2250	8.99	13500	-10.17
400	0.66	2350	9.88	14000	-12.35
420	0.90	2500	9.77	15000	-14.86
445	1.13	2650	9.52	16000	-28.85
475	1.29	2800	9.43	17000	-24.81
500	1.41	3000	8.87	18000	-23.54
530	1.56	3150	7.86	19000	-27.25
560	1.70	3350	7.34	20000	-28.93

Table 17: *HRTF at 270° azimuth angle, right ear - Brüel & Kjær Type 4128 HATS model nr.1*

Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)
100	-0.06	600	2.73	3550	16.58
105	-0.07	630	2.85	3750	15.53
110	-0.09	670	3.20	4000	14.81
120	-0.10	710	3.19	4200	14.62
125	-0.12	750	3.15	4450	14.58
135	-0.13	800	3.72	4750	14.13
140	-0.13	840	4.04	5000	13.11
150	-0.12	890	3.79	5300	12.13
160	-0.09	945	3.35	5600	10.51
170	-0.05	1000	3.03	6000	9.04
180	-0.02	1050	3.53	6300	7.69
190	0.01	1100	3.61	6700	5.67
200	0.04	1200	3.82	7100	2.24
210	0.07	1250	3.87	7500	1.10
225	0.11	1350	3.27	8000	2.75
235	0.18	1400	3.21	8400	4.92
250	0.29	1500	3.32	8900	2.21
265	0.43	1600	5.26	9450	-4.96
280	0.57	1700	6.78	10000	0.03
300	0.72	1800	8.60	10500	3.13
315	0.90	1900	10.47	11000	4.00
335	1.10	2000	12.25	12000	6.63
355	1.29	2100	14.38	12500	8.20
375	1.45	2250	16.11	13500	5.76
400	1.61	2350	17.62	14000	3.55
420	1.76	2500	18.52	15000	3.39
445	1.89	2650	18.77	16000	-1.78
475	2.01	2800	19.09	17000	-8.43
500	2.20	3000	18.82	18000	-0.93
530	2.51	3150	18.25	19000	0.69
560	2.76	3350	17.25	20000	-4.95

Table 18: *HRTF at 0° azimuth angle, right ear - G.R.A.S. KEMAR Type 45BM*

Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)
100	0.63	600	6.77	3550	15.64
105	0.64	630	7.14	3750	14.83
110	0.65	670	7.67	4000	13.03
120	0.67	710	8.11	4200	12.72
125	0.72	750	7.86	4450	14.33
135	0.79	800	7.77	4750	15.88
140	0.90	840	8.40	5000	17.12
150	1.07	890	8.01	5300	17.90
160	1.24	945	7.33	5600	17.89
170	1.39	1000	7.56	6000	18.03
180	1.51	1050	7.60	6300	18.19
190	1.60	1100	7.99	6700	18.16
200	1.69	1200	8.78	7100	17.56
210	1.80	1250	8.89	7500	16.58
225	1.94	1350	9.13	8000	16.84
235	2.12	1400	8.96	8400	17.70
250	2.37	1500	8.62	8900	13.76
265	2.63	1600	8.82	9450	8.53
280	2.86	1700	9.81	10000	1.23
300	3.07	1800	10.98	10500	8.49
315	3.32	1900	11.54	11000	10.01
335	3.60	2000	12.09	12000	10.73
355	3.86	2100	13.58	12500	13.65
375	4.06	2250	15.27	13500	9.07
400	4.26	2350	16.69	14000	3.72
420	4.51	2500	17.36	15000	2.47
445	4.79	2650	17.60	16000	-3.88
475	5.09	2800	17.49	17000	-0.70
500	5.48	3000	17.25	18000	5.54
530	5.95	3150	17.21	19000	4.51
560	6.40	3350	16.65	20000	2.74

Table 19: *HRTF at 90° azimuth angle, right ear - G.R.A.S. KEMAR Type 45BM*



Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)
100	-0.16	600	1.91	3550	13.41
105	-0.17	630	2.45	3750	12.57
110	-0.19	670	2.85	4000	11.26
120	-0.20	710	3.23	4200	10.89
125	-0.23	750	3.74	4450	10.16
135	-0.26	800	4.23	4750	9.52
140	-0.29	840	4.73	5000	8.13
150	-0.33	890	5.00	5300	7.12
160	-0.35	945	4.82	5600	5.74
170	-0.36	1000	4.31	6000	3.68
180	-0.36	1050	4.64	6300	2.18
190	-0.34	1100	4.97	6700	0.88
200	-0.33	1200	5.73	7100	-2.87
210	-0.30	1250	6.19	7500	-6.08
225	-0.27	1350	6.59	8000	-5.97
235	-0.24	1400	6.73	8400	0.25
250	-0.20	1500	6.75	8900	1.32
265	-0.16	1600	6.21	9450	-6.08
280	-0.11	1700	6.57	10000	-10.17
300	-0.05	1800	7.70	10500	-2.30
315	0.04	1900	9.01	11000	-2.85
335	0.15	2000	10.51	12000	-2.84
355	0.23	2100	11.62	12500	-2.03
375	0.31	2250	12.29	13500	-5.31
400	0.42	2350	13.01	14000	-8.44
420	0.57	2500	14.22	15000	-12.03
445	0.71	2650	14.81	16000	-13.89
475	0.77	2800	14.66	17000	-13.03
500	0.86	3000	14.29	18000	-5.06
530	1.07	3150	14.13	19000	-5.83
560	1.41	3350	13.93	20000	-8.34

Table 20: *HRTF at 180° azimuth angle, right ear - G.R.A.S. KEMAR Type 45BM*

Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)
100	-0.80	600	1.35	3550	5.45
105	-0.80	630	1.60	3750	3.69
110	-0.80	670	1.79	4000	1.61
120	-0.80	710	1.58	4200	-2.07
125	-0.81	750	0.85	4450	-3.43
135	-0.83	800	1.39	4750	-6.18
140	-0.84	840	2.80	5000	-10.48
150	-0.86	890	1.69	5300	-10.99
160	-0.87	945	2.16	5600	-12.77
170	-0.86	1000	2.64	6000	-10.43
180	-0.85	1050	1.98	6300	-10.34
190	-0.82	1100	2.17	6700	-9.56
200	-0.80	1200	2.66	7100	-11.48
210	-0.76	1250	2.15	7500	-11.51
225	-0.74	1350	3.07	8000	-11.34
235	-0.71	1400	3.28	8400	-5.25
250	-0.67	1500	4.13	8900	-3.25
265	-0.62	1600	5.04	9450	-6.68
280	-0.55	1700	5.68	10000	-9.16
300	-0.47	1800	5.77	10500	-14.52
315	-0.35	1900	5.80	11000	-18.09
335	-0.23	2000	7.12	12000	-15.99
355	-0.12	2100	7.54	12500	-11.34
375	-0.02	2250	7.88	13500	-13.16
400	0.12	2350	8.88	14000	-17.13
420	0.33	2500	9.10	15000	-22.23
445	0.55	2650	9.30	16000	-31.60
475	0.74	2800	9.59	17000	-29.63
500	0.94	3000	10.26	18000	-27.06
530	1.09	3150	8.05	19000	-31.56
560	1.19	3350	7.05	20000	-44.68

Table 21: *HRTF at 270° azimuth angle, right ear - G.R.A.S. KEMAR Type 45BM*

Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)
100	0.16	600	2.82	3550	14.69
105	0.14	630	2.87	3750	12.75
110	0.12	670	3.37	4000	12.28
120	0.08	710	4.02	4200	12.19
125	0.01	750	3.96	4450	12.46
135	-0.10	800	4.02	4750	12.57
140	-0.23	840	4.70	5000	11.22
150	-0.42	890	5.02	5300	10.76
160	-0.61	945	5.30	5600	10.12
170	-0.74	1000	4.54	6000	8.55
180	-0.79	1050	3.47	6300	6.17
190	-0.78	1100	2.19	6700	3.75
200	-0.71	1200	1.39	7100	1.80
210	-0.57	1250	0.49	7500	2.72
225	-0.38	1350	-0.34	8000	3.66
235	-0.18	1400	-0.60	8400	6.63
250	0.08	1500	2.66	8900	6.39
265	0.33	1600	5.29	9450	-2.25
280	0.59	1700	5.81	10000	-1.10
300	0.88	1800	7.34	10500	4.61
315	1.26	1900	10.03	11000	3.94
335	1.72	2000	12.26	12000	7.52
355	2.06	2100	13.40	12500	9.27
375	2.21	2250	13.90	13500	8.77
400	2.24	2350	13.82	14000	9.38
420	2.37	2500	14.83	15000	8.54
445	2.75	2650	18.21	16000	5.45
475	3.18	2800	19.73	17000	-8.53
500	3.38	3000	18.55	18000	-4.03
530	3.24	3150	17.60	19000	-0.81
560	2.98	3350	17.23	20000	-0.99

Table 22: *HRTF at 0° azimuth angle, right ear - Head Acoustics HMS II.3*

Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)
100	0.76	600	6.62	3550	15.65
105	0.72	630	6.89	3750	14.98
110	0.68	670	7.37	4000	13.09
120	0.64	710	7.89	4200	14.40
125	0.57	750	7.93	4450	16.78
135	0.52	800	7.91	4750	16.84
140	0.50	840	8.50	5000	17.21
150	0.54	890	8.11	5300	18.34
160	0.69	945	7.28	5600	18.36
170	0.92	1000	7.30	6000	17.55
180	1.19	1050	7.69	6300	16.29
190	1.47	1100	8.30	6700	16.45
200	1.73	1200	9.41	7100	17.64
210	2.01	1250	10.29	7500	17.55
225	2.25	1350	11.07	8000	16.73
235	2.43	1400	10.60	8400	16.70
250	2.59	1500	10.23	8900	17.96
265	2.72	1600	10.56	9450	15.75
280	2.88	1700	11.34	10000	11.57
300	3.11	1800	10.61	10500	7.72
315	3.44	1900	9.70	11000	3.43
335	3.82	2000	7.99	12000	3.56
355	4.10	2100	6.81	12500	10.99
375	4.26	2250	9.70	13500	7.86
400	4.39	2350	13.61	14000	8.00
420	4.52	2500	15.18	15000	11.73
445	4.58	2650	17.39	16000	4.64
475	4.66	2800	18.52	17000	1.05
500	5.05	3000	18.33	18000	8.35
530	5.75	3150	17.16	19000	4.33
560	6.34	3350	16.69	20000	10.50

Table 23: *HRTF at 90° azimuth angle, right ear - Head Acoustics HMS II.3*

Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)
100	0.00	600	1.09	3550	12.62
105	-0.05	630	1.70	3750	11.57
110	-0.11	670	2.27	4000	10.67
120	-0.17	710	2.88	4200	9.40
125	-0.30	750	3.12	4450	8.24
135	-0.45	800	3.49	4750	6.67
140	-0.62	840	4.35	5000	3.05
150	-0.80	890	4.05	5300	2.59
160	-0.88	945	3.55	5600	0.17
170	-0.81	1000	3.15	6000	1.10
180	-0.63	1050	3.24	6300	2.25
190	-0.37	1100	3.21	6700	2.32
200	-0.08	1200	4.70	7100	3.64
210	0.24	1250	5.46	7500	3.63
225	0.50	1350	5.51	8000	7.18
235	0.62	1400	4.49	8400	9.89
250	0.58	1500	4.34	8900	10.49
265	0.35	1600	4.57	9450	4.94
280	0.05	1700	6.31	10000	-1.22
300	-0.14	1800	8.16	10500	-1.03
315	-0.09	1900	8.78	11000	-1.97
335	0.21	2000	9.89	12000	-1.37
355	0.50	2100	10.45	12500	1.55
375	0.57	2250	10.66	13500	2.04
400	0.38	2350	12.20	14000	2.04
420	0.16	2500	14.18	15000	2.82
445	0.26	2650	14.82	16000	-3.99
475	0.67	2800	15.51	17000	-8.23
500	1.10	3000	14.87	18000	-10.97
530	1.17	3150	13.12	19000	-7.82
560	0.92	3350	13.09	20000	-3.27

Table 24: *HRTF at 180° azimuth angle, right ear - Head Acoustics HMS II.3*

Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)
100	-0.53	600	1.15	3550	9.52
105	-0.52	630	0.98	3750	6.38
110	-0.52	670	1.40	4000	4.84
120	-0.53	710	1.61	4200	4.00
125	-0.59	750	1.42	4450	2.72
135	-0.70	800	2.27	4750	0.83
140	-0.85	840	3.39	5000	-0.60
150	-1.11	890	2.46	5300	-2.94
160	-1.37	945	2.30	5600	-5.33
170	-1.56	1000	2.64	6000	-9.52
180	-1.64	1050	2.20	6300	-14.49
190	-1.60	1100	2.73	6700	-21.73
200	-1.45	1200	3.86	7100	-20.67
210	-1.19	1250	4.35	7500	-18.59
225	-0.90	1350	5.11	8000	-12.04
235	-0.65	1400	4.34	8400	-6.67
250	-0.46	1500	4.77	8900	-9.34
265	-0.41	1600	4.82	9450	-11.98
280	-0.43	1700	3.21	10000	-15.61
300	-0.44	1800	3.75	10500	-11.59
315	-0.30	1900	5.41	11000	-15.18
335	0.01	2000	6.38	12000	-18.90
355	0.35	2100	6.96	12500	-16.62
375	0.62	2250	8.04	13500	-16.14
400	0.90	2350	9.63	14000	-15.42
420	1.28	2500	10.65	15000	-17.32
445	1.62	2650	11.48	16000	-16.48
475	1.74	2800	10.95	17000	-19.82
500	1.71	3000	11.11	18000	-25.57
530	1.73	3150	10.12	19000	-23.03
560	1.65	3350	10.77	20000	-22.25

Table 25: *HRTF at 270° azimuth angle, right ear - Head Acoustics HMS II.3*

## 5.6 Tables for free-field measurement results - left ear from figure 33 to 36

Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)
100	-0.04	600	2.41	3550	15.65
105	-0.04	630	2.51	3750	14.75
110	-0.05	670	2.65	4000	13.62
120	-0.06	710	2.89	4200	12.30
125	-0.07	750	3.30	4450	11.30
135	-0.09	800	3.76	4750	10.31
140	-0.10	840	4.52	5000	9.64
150	-0.11	890	5.01	5300	9.07
160	-0.11	945	5.07	5600	8.15
170	-0.11	1000	4.64	6000	7.28
180	-0.10	1050	4.29	6300	6.46
190	-0.10	1100	3.82	6700	5.30
200	-0.09	1200	3.77	7100	3.89
210	-0.07	1250	3.64	7500	1.33
225	-0.04	1350	4.11	8000	-2.74
235	0.02	1400	4.61	8400	-2.53
250	0.13	1500	4.80	8900	0.63
265	0.27	1600	4.46	9450	3.86
280	0.43	1700	5.23	10000	4.04
300	0.58	1800	7.02	10500	5.75
315	0.75	1900	8.84	11000	8.68
335	0.93	2000	10.43	12000	9.46
355	1.07	2100	12.12	12500	8.26
375	1.19	2250	14.14	13500	7.66
400	1.35	2350	15.64	14000	7.46
420	1.57	2500	16.08	15000	7.34
445	1.78	2650	16.80	16000	2.32
475	1.92	2800	17.11	17000	-2.59
500	2.04	3000	16.58	18000	1.72
530	2.21	3150	16.47	19000	-1.67
560	2.36	3350	16.02	20000	-1.36

Table 26: *HRTF at 0° azimuth angle, left ear - Brüel & Kjær Type 4128 HATS model nr.2*

Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)
100	0.67	600	6.50	3550	13.87
105	0.69	630	6.85	3750	13.27
110	0.70	670	7.28	4000	13.28
120	0.73	710	7.65	4200	13.89
125	0.78	750	7.58	4450	14.56
135	0.85	800	7.63	4750	15.27
140	0.95	840	8.44	5000	16.08
150	1.10	890	8.43	5300	16.75
160	1.25	945	7.99	5600	16.74
170	1.37	1000	7.97	6000	16.56
180	1.47	1050	7.60	6300	16.22
190	1.54	1100	7.60	6700	15.82
200	1.62	1200	8.21	7100	15.72
210	1.73	1250	8.37	7500	15.76
225	1.88	1350	8.70	8000	15.45
235	2.08	1400	8.76	8400	15.65
250	2.36	1500	9.05	8900	17.80
265	2.63	1600	9.44	9450	17.07
280	2.86	1700	9.59	10000	12.38
300	3.06	1800	10.22	10500	9.53
315	3.29	1900	10.81	11000	8.35
335	3.55	2000	11.41	12000	6.84
355	3.79	2100	12.29	12500	6.65
375	3.99	2250	13.72	13500	7.36
400	4.19	2350	14.87	14000	6.49
420	4.47	2500	16.19	15000	8.59
445	4.79	2650	17.01	16000	5.90
475	5.10	2800	17.21	17000	-1.34
500	5.42	3000	16.92	18000	2.39
530	5.79	3150	16.29	19000	4.47
560	6.16	3350	15.10	20000	4.73

Table 27: *HRTF at 90° azimuth angle, left ear - Brüel & Kjær Type 4128 HATS model nr.2*



Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)
100	-0.08	600	1.57	3550	12.41
105	-0.08	630	1.74	3750	11.12
110	-0.09	670	2.11	4000	9.42
120	-0.09	710	2.46	4200	8.75
125	-0.10	750	2.92	4450	7.81
135	-0.11	800	3.74	4750	6.81
140	-0.12	840	4.48	5000	5.20
150	-0.14	890	4.85	5300	3.89
160	-0.15	945	4.98	5600	3.01
170	-0.15	1000	4.50	6000	2.06
180	-0.15	1050	4.13	6300	0.99
190	-0.14	1100	4.08	6700	-0.37
200	-0.13	1200	4.23	7100	-1.58
210	-0.10	1250	4.73	7500	-1.74
225	-0.05	1350	5.17	8000	0.71
235	0.02	1400	5.40	8400	4.77
250	0.12	1500	5.13	8900	9.28
265	0.23	1600	4.90	9450	8.03
280	0.35	1700	5.27	10000	1.95
300	0.46	1800	6.22	10500	-0.76
315	0.59	1900	6.95	11000	-1.80
335	0.73	2000	8.30	12000	-4.41
355	0.85	2100	10.30	12500	-2.91
375	0.93	2250	11.94	13500	-5.25
400	0.99	2350	12.82	14000	-4.66
420	1.09	2500	13.78	15000	-0.82
445	1.19	2650	14.39	16000	-0.77
475	1.25	2800	14.05	17000	-5.78
500	1.30	3000	13.72	18000	-6.86
530	1.41	3150	13.68	19000	-16.97
560	1.55	3350	12.97	20000	-10.78

Table 28: *HRTF at 180° azimuth angle, left ear - Brüel & Kjær Type 4128 HATS model nr.2*

Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)
100	-0.74	600	1.66	3550	5.66
105	-0.73	630	1.90	3750	5.15
110	-0.72	670	2.17	4000	3.16
120	-0.71	710	2.12	4200	1.20
125	-0.71	750	1.55	4450	-0.93
135	-0.70	800	2.10	4750	-2.87
140	-0.70	840	3.33	5000	-5.15
150	-0.71	890	2.40	5300	-7.82
160	-0.71	945	2.46	5600	-11.59
170	-0.71	1000	2.71	6000	-15.10
180	-0.70	1050	1.96	6300	-16.66
190	-0.69	1100	2.17	6700	-15.50
200	-0.68	1200	2.88	7100	-12.92
210	-0.66	1250	2.83	7500	-12.38
225	-0.63	1350	3.74	8000	-11.31
235	-0.59	1400	3.79	8400	-11.72
250	-0.50	1500	4.06	8900	-11.12
265	-0.39	1600	4.65	9450	-10.09
280	-0.25	1700	5.13	10000	-11.79
300	-0.11	1800	5.90	10500	-11.72
315	0.05	1900	7.00	11000	-10.29
335	0.20	2000	7.88	12000	-10.03
355	0.32	2100	8.01	12500	-10.24
375	0.42	2250	8.78	13500	-11.39
400	0.58	2350	9.93	14000	-13.84
420	0.82	2500	10.05	15000	-16.38
445	1.05	2650	9.93	16000	-26.24
475	1.23	2800	9.95	17000	-21.15
500	1.38	3000	9.15	18000	-19.82
530	1.49	3150	8.10	19000	-25.55
560	1.55	3350	7.17	20000	-26.12

Table 29: *HRTF at 270° azimuth angle, left ear - Brüel & Kjær Type 4128 HATS model nr.2*

## 5.7 Tables for free-field measurement results - repeatability from figure 7

Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)	Freq. (Hz)	Ampli. (dB)
100	0.00*	600	0.17	3550	0.34
105	0.00*	630	0.12	3750	0.20
110	0.01	670	0.10	4000	0.16
120	0.01	710	0.11	4200	0.18
125	0.01	750	0.21	4450	0.18
135	0.01	800	0.20	4750	0.21
140	0.02	840	0.23	5000	0.27
150	0.03	890	0.24	5300	0.38
160	0.03	945	0.21	5600	0.30
170	0.03	1000	0.24	6000	0.23
180	0.04	1050	0.21	6300	0.33
190	0.04	1100	0.23	6700	0.41
200	0.06	1200	0.14	7100	0.36
210	0.07	1250	0.12	7500	0.26
225	0.06	1350	0.13	8000	0.26
235	0.06	1400	0.12	8400	0.35
250	0.09	1500	0.04	8900	0.28
265	0.09	1600	0.10	9450	0.23
280	0.10	1700	0.16	10000	0.30
300	0.10	1800	0.24	10500	0.37
315	0.10	1900	0.28	11000	0.38
335	0.11	2000	0.29	12000	0.34
355	0.12	2100	0.28	12500	0.36
375	0.12	2250	0.27	13500	0.33
400	0.13	2350	0.22	14000	0.28
420	0.13	2500	0.22	15000	0.54
445	0.12	2650	0.26	16000	0.60
475	0.14	2800	0.25	17000	0.32
500	0.14	3000	0.25	18000	0.21
530	0.15	3150	0.27	19000	0.26
560	0.16	3350	0.22	20000	0.25

Table 30: *Two HRTF measurements divided by each other to show deviation between the two, to illustrate reproducibility. HRTFs are from the Brüel & Kjær Type 4128-C HATS model nr. 1, in the frontal direction.*

\* At low frequencies, the wave length is very long (e.g. 3.43m at 100 Hz) and therefore the physical changes in the setup affects less on the HRTFs measurements. 0.00 dB happens since numbers are given to two decimal places, and differences are less than 0.01 dB.